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To jwp
cc Ray Basso, Kedari Reddy, Patricia Hick, Elizabeth Butler
bcc
Subject Materials requested

As you requested during the 11/10 meeting, attached are a detailed description of the tasks included in the cost estimate for the CERCLA portion of the Passaic River Study and a task-level schedule for 2006. Please let me know if you have any questions.


CERCLA costs descriptions.doc


Task Level Schedule for 06.doc

Lower Passaic River Restoration Project
CERCLA Costs – PRP Funding
Description of Cost Categories

Note: Tasks labeled MPI (Malcolm Pirnie) cover MPI, HydroQual, Battelle, and any other subcontractor costs (Technical Advisory Committee, field sampling, laboratories, etc)

USACE-KC Contract Administration

Labor, Overhead & Travel

⇒ USACE-KC Contracting Officer's Representative administration of MPI contract.

Sedflume

⇒ USACE-ERDC personnel, equipment, sample analysis for Sedflume experiment

Superfund M&S Fee

⇒ USACE Headquarters, Divisions and Center of Expertise administrative costs as a percentage applied to all IAGs between EPA and USACE.

MPI Project Administration

Project Management/Subcontract Administration

⇒ Progress reports and invoices
⇒ Updating project schedule and budget forecasting
⇒ Regular conference calls on project progress.
⇒ General communications among prime and sub-contractors.
⇒ Preparation and participation in Work Group meetings.
⇒ Procurement and administration of laboratory subcontractors and TAC (technical advisory committee).

Internal Web Site/Data Management (note: PREmis is the internal web site)

⇒ PREmis field application development (electronic system that field crews use to track samples collected), including programming to transfer relevant data to EPA's FormsII Lite application.
⇒ CARP data conversion and upload to PREmis

Technical Support

⇒ Additional technical work not specifically predicted and costed out during contract negotiations. Use of funds subject to EPA/USACE approval.

MPI Fee

MPI Community Relations

Public Web Site/Mtgs/Fact Sheets/CIP

⇒ Preparation and participation in public meetings

- ⇒ Finalization of fact sheets (text developed by EPA, MPI adds pictures and formatting)
- ⇒ Community Involvement Plan (CIP) stakeholder interviews
- ⇒ CIP draft and final.
- ⇒ Public web site (www.ourPassaic.org) maintenance.

MPI Work Plans

WP/FSPs/QAPP/HASP/Modeling Plan

- ⇒ Agency Scoping Meeting
- ⇒ Evaluation of historical data
- ⇒ Development of DQOs/ARARs/PRGs and Conceptual Site Model (geochemical)
- ⇒ Work Plan (WP) drafts and final
- ⇒ Quality Assurance Project Plan (QAPP) drafts, final and updates for methodology changes
- ⇒ Health and Safety Plan (HASP) drafts and final
- ⇒ Field Sampling Plan (FSP) 1 drafts, final and updates
- ⇒ Development of CERCLA portions of FSP 2
- ⇒ FSP 3 coordination with USACE-NY
- ⇒ Modeling Plan drafts and final

MPI Risk Assessment

Risk Assessment

- ⇒ Pathways Analysis Report (PAR) drafts and final
- ⇒ Conceptual Site Model (human health & ecological risk assessments)
- ⇒ Baseline risk assessments

MPI Sampling/Field Work

Mobilization/Demobilization/Travel

- ⇒ Field Office rental, maintenance, dock installation, equipment
- ⇒ Field crew travel expenses
- ⇒ Coordination with EPA Regional Sample Control Center (for samples to be analyzed by EPA's Edison lab or national contract laboratories)
- ⇒ Health and safety administration

Hydrodynamic Sampling

- ⇒ Sampling equipment for upper 11 miles (moorings, ADCP, CTD, OBS, etc…): deployment and periodic retrieval for data download/maintenance
- ⇒ Health and safety for hydrodynamic sampling
- ⇒ Ship-board surveys (surface water collection and analysis)
- ⇒ Sediment erosion experiments (Microcosm and MPI assistance for Sedflume; note that Sedflume equipment and USACE personnel not included here)

Sediment Cores/Water Qual Samples (includes high resolution coring, low resolution coring, mudflat sampling, surface water quality sampling)

- ⇒ Sediment coring subcontractor (includes core collection personnel and coring boats)
- ⇒ Sediment core segmentation, processing, laboratory analysis
- ⇒ Water quality sample collection, processing, laboratory analysis (SPMDs, small volume grabs for metals, large volume samples vs. TOPS for organics)
- ⇒ Field Quality Control Officer, Quality Assurance Coordinator, health and safety audits for sediment coring and water quality sampling efforts

Biota Sampling

- ⇒ General estimate for CERCLA data needs: sample collection and analysis

CSO Sampling Oversight

- ⇒ MPI personnel oversight of TSI CSO sampling efforts.

MPI Modeling

Model Development/Calibration

- ⇒ Development of Passaic River/Newark Bay model based on CARP Harbor-wide model (includes Hydrodynamic, Sediment Transport, Chemical Fate & Transport, Food Chain components).
- ⇒ Calibration of Passaic River/Newark Bay model
- ⇒ See Attachment for details

Baseline Modeling

- ⇒ General estimate for set up and running of remedial option scenarios

MPI RI Report/Data Evaluation

Data Evaluation & Validation

- ⇒ For newly collected data: data upload to PREmis and data validation
- ⇒ Additional historical geochemical data analyses
- ⇒ Evaluation of newly collected data (hydrodynamic, sediment coring, water quality sampling, biota, etc.)
- ⇒ Recommendation for future sampling to fill in data gaps.

RI Report

- ⇒ General estimate for RI Report writing (drafts and final).

MPI Feasibility Study

Feasibility Study

- ⇒ Interim Remedial Measure evaluations
- ⇒ General estimate for Feasibility Study work and report writing (draft and final)
- ⇒ Includes coordination to produce CERCLA-WRDA Integrated Feasibility Study.

EPA Administrative Costs

Labor, Overhead & Travel

⇒ EPA personnel, including project officer, PRP search technical support, modeling expert, risk assessors, attorneys, public affairs specialists, Edison laboratory personnel, sediment decontamination program manager, grants administrator, etc…

Contract Lab Program and DESA Validation

⇒ Analytical services from contract laboratories managed by EPA Region 2 Division of Environmental Science and Assessment (DESA).

⇒ Validation from contractor managed by DESA for data analyzed by DESA personnel and Contract Lab Program (CLP).

File Room

⇒ Contractor managed by EPA Region 2 to maintain Superfund site files (enforcement and technical) at NYC office and to send Administrative Record files to document repositories in Newark NJ.

USACE-KC IAG Overhead

⇒ EPA Headquarters administrative costs to manage USACE-KC IAG.

Attachment
Detailed Description of Passaic River/Newark Bay Model Development/Calibration
Based on CARP Harbor-Wide Model

Hydrodynamic Transport Component

- Grid design and definition of fine-grid model domain;
  - Obtain topographical and bathymetric data for model domain.
  - Incorporate periodic variation on model bathymetry (*e.g.*, dredging occurrences in part of domain).
  - Gather aerial, ortho- and satellite photos, especially from before and after significant events to determine extent of flooding within the domain.
  - Generate first cut of horizontal grid box placement.
  - Determine downstream hydrodynamics fine-grid blending with coarse-grid CARP model placement and available data.
  - Determination of downstream boundaries of fine-grid requires CARP Water Quality runs with just NJ tributary loads to better define downstream boundaries that are minimally affected by these loads
  - The grid design will include a coarse representation of the wetland region adjacent to the Hackensack River and Meadowlands. This task aims at providing a representation of the storage volume within this complex channel network.
  - Refine grid and determine appropriate horizontal and vertical resolutions.

- Prepare CARP model runs for the 6 years where CARP model output is unavailable (model output is available for the following years: 1995-96 through 1997-1998 and 2003-4 through 2005-6) such that a full 11-year period of CARP output becomes available for use in calibration of the model for the Lower Passaic River Restoration Project;
  - Gather upstream boundary and tributary flows.
  - Gather atmospheric inputs and forcing (*e.g.*, wind speed and direction, heat flux, air temperature and humidity, cloud cover).
  - Run sewer-shed (SWMM) model calculation for CSO, SWO inflows.
  - Generate model input files for CARP runs.
  - Make CARP model runs.
  - Perform brief salinity and temperature calibration for the six years of runs.

- Configure fine-grid model calibration run for USGS water years 1994-95 through 2005-6 for 11-year calibration
  - Generate input files for Lower Passaic River (LPR) grid.
  - Many inputs/forcing functions gathered for CARP runs will also be used for this task.
  - Inputs/forcing data will be applied and/or interpolated to LPR fine grid.
  - Set initial model parameters for horizontal and vertical mixing.
- Incorporate wetting and drying protocol
- Hydrodynamic model calibration
  - Extract appropriate date from CARP model output.

- Process CARP output for LPR boundary input files.
- Perform fine-grid model run spin-up.
- Perform fine-grid model runs.
- Compare fine-grid model results against historical data, 2004 Hydrodynamic Field Studies, 2005 Field Studies as data become available.
- Refine boundary locations.
- Rerun model with varying model bathymetries for appropriate periods.
- Organize model output into tabular and graphical formats.
- Generate time series plots of model results and calibration data.
- Generate spatial plots (vertical slices) of transects.
- Generate spatial plots (vertical slices) along channel length.
- Generate map views with model results and calibration data.
- Prepare animations of plots.
- Prepare statistical comparison between model results and calibration data.
- Compare model result to calibration data quality and/or sensitivity parameters according to QAPP.

- Report writing and presentations

<u>Sediment Transport Component</u>

- Generate bed conditions
  - Determine global (domain-wide) grain size distribution and choose representative model size classes.
  - Determine number of representative size classes.
  - Obtain sediment bed properties map from sediment core data including porosity and bulk density, grain size distribution, particulate organic carbon, and properties variations with depth into bed.
  - Interpolate sediment core data onto all bed grid cells.
  - Determine floodplain soil properties map.

- Incorporate bed layering protocol to represent the variation in erodibility with depth and time

- Incorporate shear stress protocol
  - Split fluid shear stress between form drag and skin friction components.
  - Incorporate wave-induced shear stress components.

- Determine fine-grid model solids boundary conditions
  - Obtain upstream solids loads.
  - Determine solids loads from tributaries, CSOs and other outfalls within the sewer-shed.
  - Perform normalized sediment load analysis.
  - Determine initial model parameters for settling, flocculation, erosion, deposition and bed evolution and interpolate to model grid cells – use results from historical erosion (Sedflume and Shaker) studies.

- Establish solids boundary condition at CARP/LPR downstream model boundary.
- Process loads data to model input format.

- Construct model linkages with hydrodynamic transport model
  - Process hydrodynamics model output for use in sediment transport model

- Sediment transport model calibration
  - Extract and process CARP output for LPR boundary input files.
  - Perform model run spin-up.
  - Perform model runs.
  - Refine model solids settling, erosion, erosion, bed evolution parameters – compare against 2004 Hydrodynamic Studies, 2005 Field Studies (erosion studies with Sedflume, Shaker and Microcosm) as data becomes available.
  - Refine hydrodynamic bottom roughness with sediment bed surface properties map.
  - Check total solids mass balance.
  - Check solids accumulation over model calibration period – comparison against historical Cesium analysis and 2005 Field Studies Cesium data.
  - Refine bottom bed properties and bed evolution – comparison against historical deposition patterns derived from dredging records and any newly acquired bathymetry.
  - Organize model output into tabular and graphical formats.
  - Generate time series plots of model results and calibration data.
  - Generate spatial plots (vertical slices) of transects.
  - Generate spatial plots (vertical slices) along channel length.
  - Generate map views with model results and calibration data.
  - Prepare animations of plots.
  - Prepare statistical comparison between model results and calibration data.
  - Compute model result to calibration data quality and/or sensitivity parameters according to QAPP.

- Report writing and presentations

<u>Chemical Fate & Transport Component</u>

- Determine what set of COPCs to simulate
- Determine model run protocol COPCs (*i.e.*, how to group sets of COPCs for each model runs, and what order)
- For a small set of COPCs make initial runs
  - Determine subset of COPCs that provide a range of partition coefficients
  - Obtain 1 year of upstream loads
  - Obtain 1 year of loads from tributaries, CSOs and other outfalls within the sewer-shed
  - Conduct the normalized load analysis
  - Process data to LPR model input format
  - Determine initial model parameters
  - Construct model linkages with hydrodynamic and sediment transport models

  - Set up model run protocol and make model runs
- Process model output
  - Generate initial model output into tabular and graphical forms
  - Incorporate calibration data if available

- Report writing and presentations

Food Chain Component

- Choose set of representative organisms
- Describe site-specific conceptual model
- Report writing and presentations

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Task Level Schedule for 2006

Finalize Community Involvement Plan	Nov 05-Feb 06
Finalize Modeling Plan	Nov 05-Feb 06
Model Development & Calibration:	
Hydrodynamic Component	Apr 05-Mar 06
Sediment Transport Component	Oct 05-Aug 07
Fate & Transport Component	Jan 06-Dec 07
Field Sampling Plan 1:	
Finalize High/Low Resolution Coring & WQ Components	Nov 05
Finalize Mudflat Sampling Component	Jan – May 06
Field Sampling Plan 2:	
Draft	Jan – May 06
Final	Jul – Aug 06
Field Sampling Plan 3:	
Draft 2	Jan – Feb 06
Final	Apr – May 06
High Resolution Cores:	
Data analyzed & validated	Jan – Apr 06
Low Resolution Cores (I):	
Collection	Dec 05
Data analyzed & validated	Jan – Apr 06
Water Quality Sampling (I):	
Collection	Nov – Dec 05
Data analyzed & validated	Jan – Apr 06
Evaluate Interim Remedial Measure	Nov 05 – Sept 06
Biota Sampling (I):	
Obtain equipment	Jun – Jul 06
Collection	Aug – Dec 06
Low Resolution Cores (II) Collection	Aug – Dec 06
Water Quality Sample (II) Collection	Jun – Dec 06
Mudflat Sample Collection	May – Oct 06